C3344

Log Data Report

Borehole Information:

Borehole: C3344			Site: 216-B-38		
Coordinates		GWL[1] (ft):	N/A[2]	GWL Date:	
North	East	Drill Date	TOC[3] Elevation	Total Depth (ft)	Type
N/A	N/A	June 2001	N/A	60	push

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
steel threaded	0.5	6.625	5.625	0.5	0	59.5

Borehole Notes:

This is a temporary borehole pushed to a depth of approximately 60 ft. There is a gravel pad approximately 1 ft thick, and the top of casing sticks up approximately 0.5 ft above the gravel surface.

Logging Equipment Information:

Logging System:	Gamma 2B		Type: SGLS (35%)
Calibration Date:	09/00	Calibration Reference:	GJO-HAN-245-TAR
		Logging Procedure:	MAC-HGLP 1.6.5

Logging System:	RLS		Type: NMLS (Moisture)
Calibration Date:	05/01	Calibration Reference:	GJO-HAN-247-TAR
		Logging Procedure:	MAC-HGLP 1.6.5

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 (repeat)			
Date	7/02/01	7/02/01			
Logging Engineer	Musial/Spatz	Musial/Spatz			
Start Depth	59.5	10.0			
Finish Depth	1	4.0			
Count Time (sec)	150	150			
Live/Real	L	L			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.5	0.5			
ft/min	n/a[4]	n/a			
Pre-Verification	B0012CAB	B0012CAB			
Start File	B0012000	B0012118			
Finish File	B0012117	B0012130			
Post-Verification	B0012CAA	B0012CAA			

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 (repeat)			
Date	7/23/01	7/23/01			
Logging Engineer	Kos/Spatz	Kos/Spatz			
Start Depth	0.0	36.0			
Finish Depth	59.5	29.5			
Count Time (sec)	n/a	n/a			
Live/Real	n/a	n/a			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
ft/min	1.0	1.0			
Pre-Verification	C0042CAB	C0042CAB			
Start File	C0042000	C0042239			
Finish File	C0042238	C0042264			
Post-Verification	C0062CAA	C0062CAA			

Logging Operation Notes:

The zero reference point for all log data is the top of casing. Depths have been adjusted to ground surface, which is taken as the top of the gravel pad. Fine-gain adjustments were made in run 1 after file B0012094 (12.5 ft).

Analysis Notes:

Analyst:	McCain	**Date:**	07/27/01	**Reference:**	MAC-VZCP 1.7.9, Rev. 2

The pre-run verification spectrum was found to be within acceptance criteria. The post-run verification spectrum was below the lower warning limit for all three peak intensities (609, 1461, and 2615 keV). FWHM values were within verification criteria. Comparison of the two spectra indicates the tool appears to be functioning properly. Individual spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with EXCEL. Corrections were applied for casing thickness. Water correction was not required. Dead time was less than 1 percent over the entire borehole, and no dead time corrections were required. The ^{214}Bi peak at 1764 keV

was used to determine ^{238}U concentrations instead of the ^{214}Bi peak at 609 keV. This was done for consistency with boreholes C3340, C3341, and C3342, where interference from the ^{137}Cs peak at 662 keV affected the ^{214}Bi peak at 609 keV.

The neutron moisture log was processed using the calibration relationship developed for a 6-inch-diameter borehole with 0.28-inch-thick casing. A correction factor of 1.20 was applied to account for the effects of the thicker casing, which is based on an equivalent casing correction for 8-inch diameter developed by Randall.

Log Plot Notes:

Separate log plots are provided for gross gamma and dead time, naturally occurring radionuclides (^{40}K, and decay progeny of ^{232}Th and ^{238}U), and man-made radionuclides. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable activity (MDA) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, or casing and water corrections. These errors are discussed in the calibration report. A combination plot is also included to facilitate correlation.

A repeat log plot is also shown. The repeat plot indicates good agreement between successive log runs, demonstrating good repeatability in both depth and radionuclide measurement.

Results and Interpretations:

Only minor amounts of Cs-137 were detected by the SLGS between 4.5 and 5 ft. The maximum concentration of 0.8 pCi/g occurred at 4.5 ft.

Increases in gamma counts at 38 to 39 ft are attributed to increases in natural radionuclides. This may be an indication of a stratigraphic change associated with an increase in fines.

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[1] GWL – groundwater level
[2] N/A – not available
[3] TOC – top of casing
[4] n/a – not applicable

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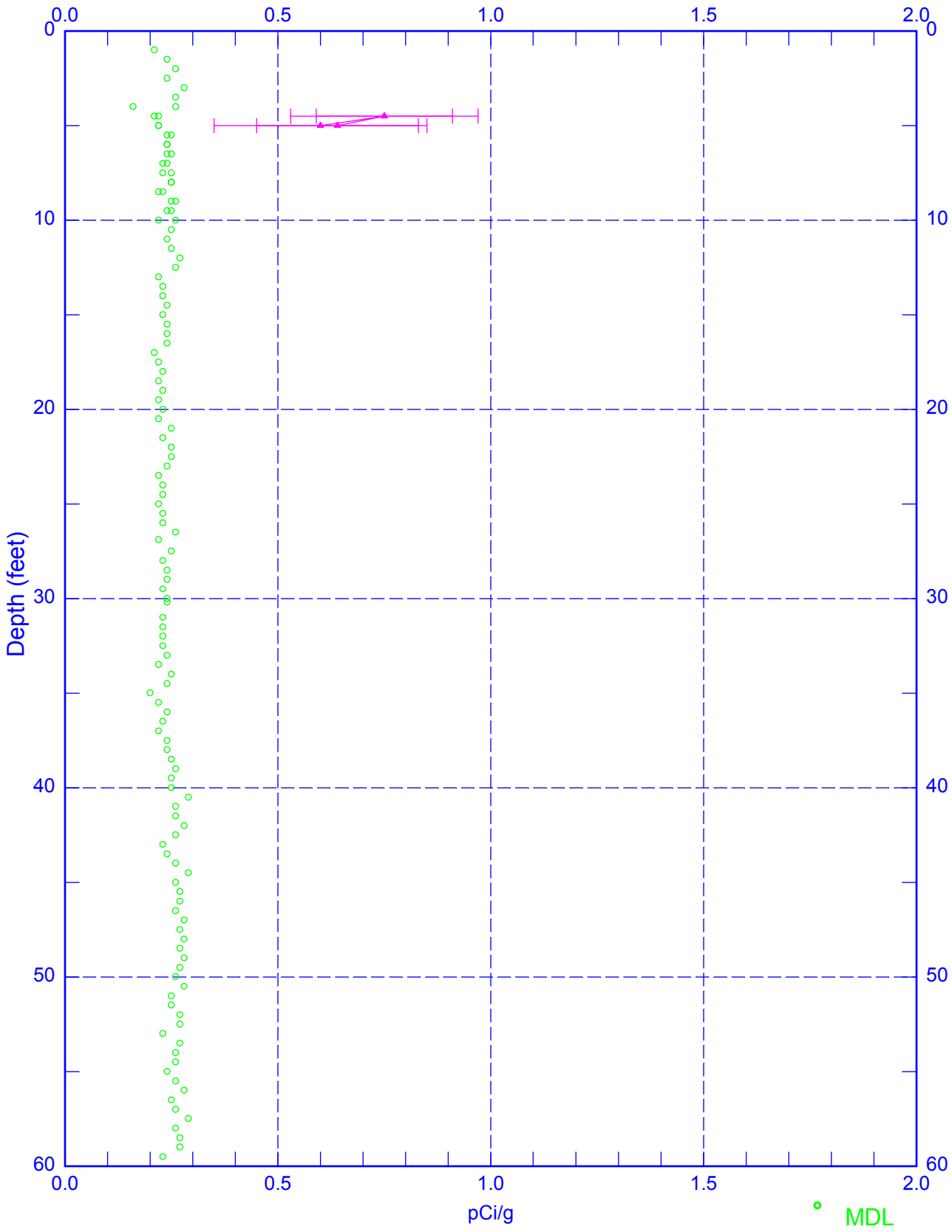
Man-Made Radionuclides

^{137}Cs (662 keV)



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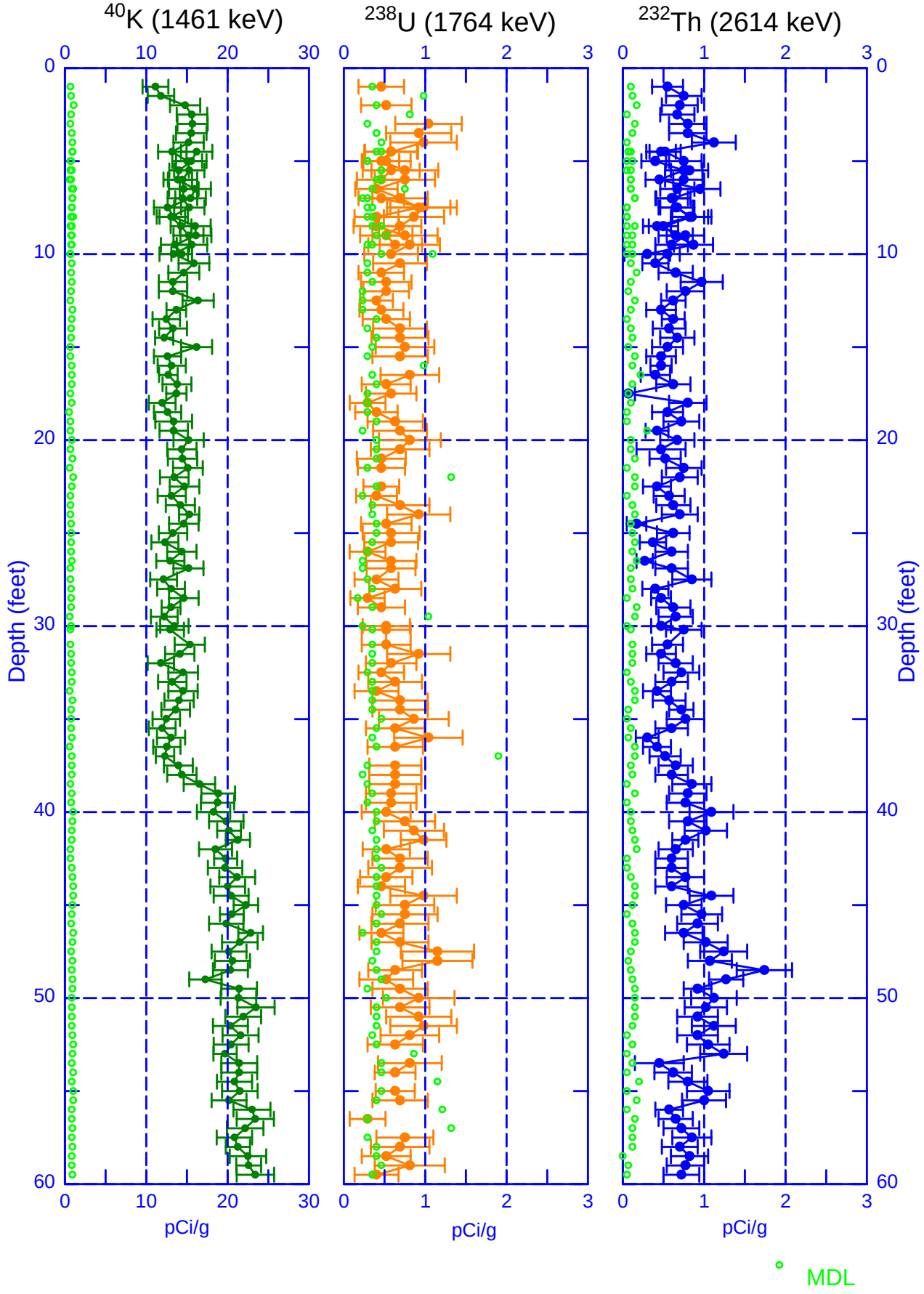
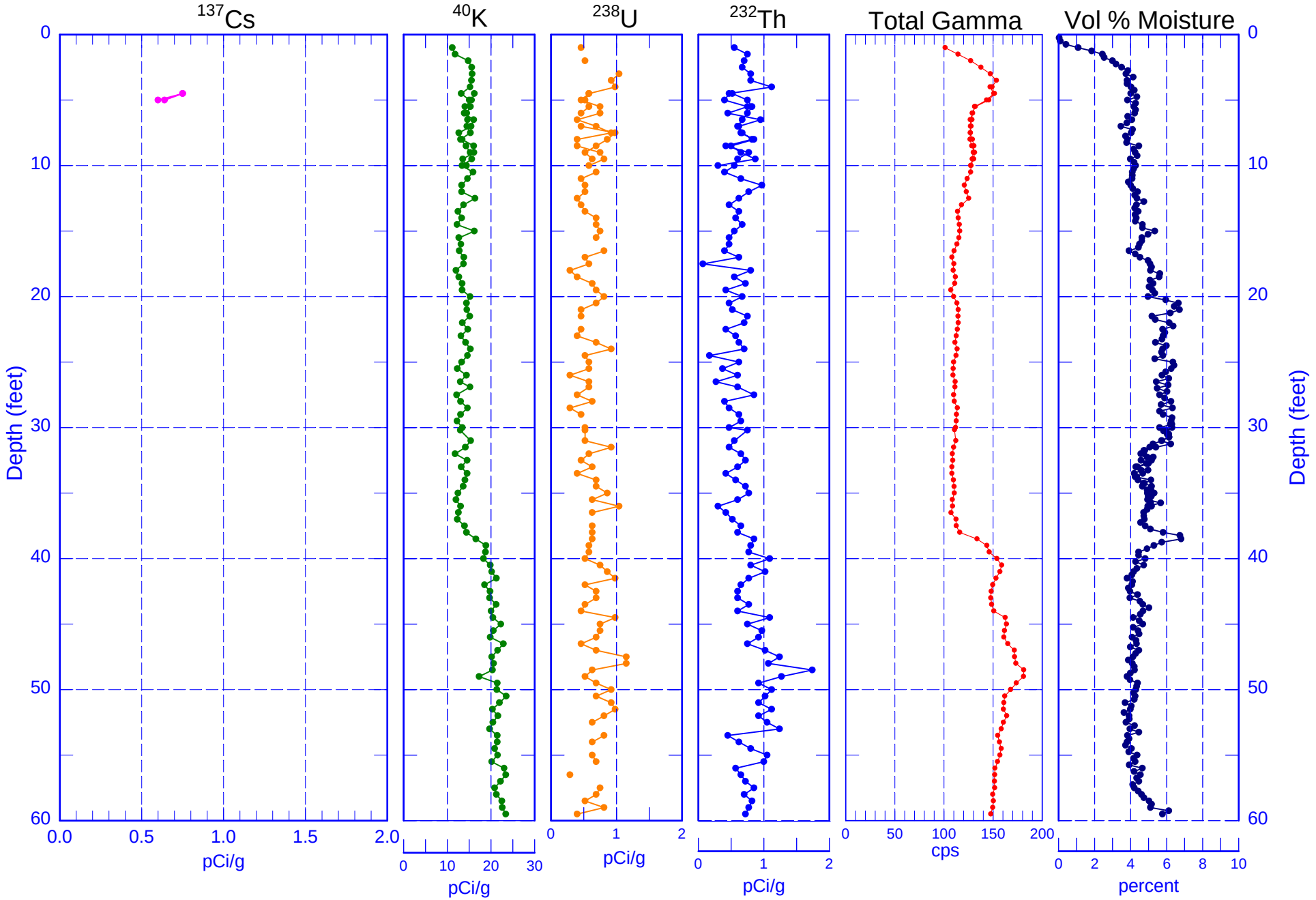
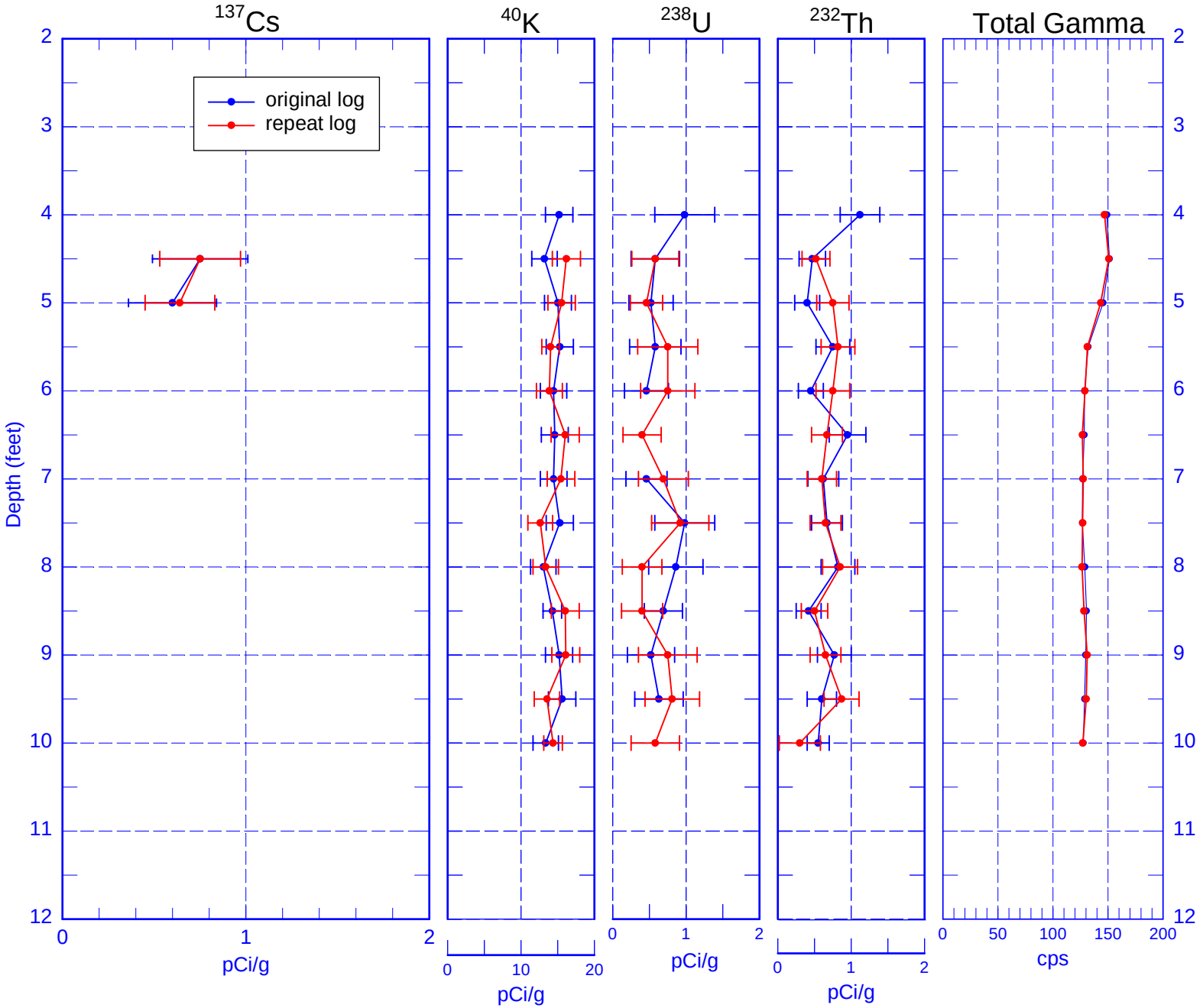
Natural Gamma (KUT) Logs



C3344 Combination Plots



C3344 Repeat Plots



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Total Gamma and Dead Time